5.2 Existing Conditions of the Target Wetlands

(1) Distribution of wetlands in the study area

Based on the analysis of LANDSAT imagery, the ratio of wetlands by sub-basins at lowlands are shown in **Table 5.2-1**. The ratio exceeds 10 % at L40-1, 2 and 3 which are areas surrounded by eastern shore of Mirim Lake, Canal do Sao Goncalo, estuarine shore of Patos Lake and the Atlantic coast. The ratio exceeds 50 % at L40-2 (an area in which Rio Grande is located). Rice paddy fields occupy large part in those areas as artificial wetlands.

(2) Hydrological conditions

Hydrological features of selected wetlands were summarized in **Tables 5.2-2** and **5.2-3**. Factors affecting water-level those of wetlands are shown in **Tables 5.2-4 and 5.2-5**. Catchment areas of respective wetlands around Patos and Mirim Lakes are generally small for its open water size. Large wetlands like Mangueira Lake and Del Rei Wetland is also maintained by only local precipitation. Seasonal water level fluctuation of Patos Lake and attached wetlands is in rough average 60 cm (different by places) influenced by the inflow from Guaiva river. Comparing the landscape of wetlands between two surveys in February and September, the most clear difference was observed at shores of Mirim Lake; *i.e*. lake water reached far inner part of the shore at high water time due to flatness of the shore. Wind blow on the lake seemed another factor affecting it. Riparian forest of Camaquã River is inundated for some weeks (duration varies according to the year) at flooding time. Although all the forested areas are not inundated, it certainly protected the forest from development. The flood level is higher at the middle reaches than the river mouth, and this reflects the fact that the richest forest remain in such a place.

(3) Water quality

Except for estuarine area of Patos Lake, seemingly no wetlands are suffering from water quality deterioration (**Tables 5.2-2 and 5.2-3**). Proliferation of water hyacinth as an indicator of eutrophication was not noticeable although they were common at irrigation channels and shores of shallow stagnant lakes. In aerial surveys, occurrence of algal

bloom was only once observed in February at a quite small pond (not a selected wetland) in the suburbs of Porto Alegre. However, there might be a potential threat of agrochemical contamination since most wetlands collect water from agricultural lands. This issue is mentioned in Chapter 4.

(4) Ecological conditions

Wetland ecosystem status is shown in **Tables 5.2-6** and **5.2-7**. The most apparent threats to wetland vegetation was cattle invasion. This indicates that agricultural impacts on wetlands are key factors for the wetland conservation plan in the study area. It is also noteworthy that riparian forest support rich faunal as well as floral biodiversity including endangered species. Riparian forest seems meritorious even for fishes. In view of the fact that remaining riparian forests in Rio Grande do Sul State are much less than meadow/marsh-type wetlands and that forest regeneration takes longer time, this wetland type should be of first conservation priority. Water balance also affects wetland ecosystems through vegetation changes. It should be noted that faunal conservation is possible only through protection of their habitat.

(5) Land Use

As shown in **Table 5.2-8** almost all wetland areas had pastures. Rice paddy was also quite common. The areas of natural forest were generally small except for the case of Camaquã river. Artificial forest mainly distributed at coastal wetlands of L20 sub-basin. Marsh areas were richer in the wetlands at Mirim Lake Basin. Urban areas were mostly limited to Pelotas and Rio Grande.

(6) Human Activities

Most wetlands of the study area are surrounded by rice fields and/or cattle pastures. This affects wetlands through 1) wetland drainage activities for expansion of those areas, and 2) irrigation water intake from wetlands. The former is historically the largest cause of wetland loss. Illegal drainage is still ongoing as witnessed at Lagoa Pequena. Although drainage problem is not emphasized in **Tables 5.2-9 and 5.2-10,** this is because such activity can not be checked by the aerial survey. On site survey and

questionnaire are necessary. Water of many wetlands are used for irrigation as seen for Mangueira Lake, Del Rei wetland and lakes along the eastern shore of Patos Lake. This helped survival of such wetlands paradoxically. The influence of water intake on wetland water balance needs quantitative investigation. Siltation is another hydrological issue. Some part of Mirim Lake has become shallow so as to impede navigation. Although it is a natural succession process of wetlands, catchment erosion by agriculture is largely accelerating the rate.

(7) Affiliation between human and wetlands

To promote wetland conservation and wise use through participation of local communities and NGOs, it is indispensable that local people become familiar with the wetlands and appreciate the values. **Tables 5.2-11** and **5.2-12** indicates opportunities that ordinary citizens can visit the wetland sites and get information about them. At present such opportunities are surprisingly small, and wetlands are used for neither education and tourism. For example, accessible point to the huge Mirim Lake by road is limited only to the Port of Santa Vitoria do Palmar. Mangueira Lake is also in similar situation. Mid-to-small size wetlands are mostly located in private farmlands and not accessible to citizens without permission of land owners.

Table 5.2-1 Wetland areas at lowland sub-basins identified from satellite imagery (1998) *[1]

	Patos basin							Mirim basin					Total
Name of sub-basin*[2]	L20	L30-5	L30-4	L30-6	L40-8	L40-2	Sub-total	L40-1	L40-3	L40-7	L40-5	Sub-total	
Ratio of Wetland areas (%) *[3]; *[4]	7.6%	7.9%	3.7%	3.4%	0.0%	52.5%	6.9%	17.2%	22.8%	0.0%	0.0%	12.5%	9.3%
Total area of sub-basin (km^2)	5,844	2,587	3,999	1,401	1,646	491	15,968	3,681	3,966	933	3,709	12,289	28,257

*1: Source JICA Study Team

*2: Some sub-basins include hilly areas.

*3: Total of normal wetlands and seasonally water-logged pastures.

*4: Open water areas are excluded.

Table 5.2-2 Hydrological features and values of selected wetlands at Patos Lake Basin

No.	Sub-basin	Wetland Areas	Wetland types according to Ramsar guideline	Features						Values				Remarks
				Origins (N, natural; A, artificial)	Water quality *1	Permanence of water *2	Seasonal water level fluctuation	Tidal influence	Catchment area *3	Ground water recharge	Flood control	Sediment trapping	Shoreline stabilization *4	
1	L30-3	Rio Camaquã riverside	M	N			○		L*3		○		○	
2	L30-4	Parque Estadual do Camaquã	L, Xf	N			○		L		○		○	
3	L30-5	Agricultural reservoirs near Arambaré	2,4,3,6	A		○			S*4					
4	L30-5	Wetland system near Lagoa do Cerro	O, 4	N					S					
5	L30-5	Lagoa Formosa (near Tapes)	O, 4	N					S					
6	L30-5	Arroio Velhaco	M, Xf	N									○	
7	L30-6	Banhado do Caipira	Ts, 4	N			○	○	S					
8	L30-6	Arroio Grande in L30-6	M, Xf	N									○	
9	L40-8	Lagoa Pequena	Ts, 4	N			○	○						
10	L20	Parque Estadual de Itapuã	O	N			○							
11	L20	Lagoa dos Barros	O	N										
12	L20	Lagoa Capivary	O, 3, 4	N										
13	L20	Lagoa dos Gateados	O, 3, 4	N										
14	L20	Banhado Grande in L20	-	N					S					
15	L20	Banhado das Casimbas	-	N					S					
16	L20	Lagoa da Reserva	O, 3, 4	N					S					
17	L20	Lagoa do Rincão	O, 3, 4	N					S					
18	L20	Lagoa do Sumidouro	O, 4	N					S					
19	L20	Banhado Claudinho	O, 3, 4	N				○	S					
20	L20	Coastal lakes north of Peixe National Park	E	N		○			S					
21	L20	Lagoa do Peixe National Park	J, Ts, E, 4	N			○	○	S					
22	L20	Coast between Peixe N.P. and Rio Grande	O, Q	N				○						
23	L40-2	Lagoa da Turnera	O, Ts	N					S					
24	L20	Lagoa dos Patos eastern (L20) side	O, Q, 3, 4	N			○	○	L					
25	L30-5,6	Lagoa dos Patos western (L30-5,L30-6) sic	O, Q, 3, 4	N			○	○	L					
26	L40-2	Lagoa dos Patos estuarine (L40-2) part	O, J, H	N				○	L					
27	L40-2	Ilha da Torotama	Ts	N	○			○	L					
28	L40-2	Saco do Mangueira	J	N	○			○	S					

Note: *1; Apparently polluted; *2, Without outlets except for artificial ones; *3, Larger than approximately 1,000km^2, *4, Limited to adjacent areas of the wetland; *5, River shore include

Table 5.2-3 Hydrological features and values of selected wetlands at Mirim Lake Basin

No.	Sub-basin	Wetland Areas	Wetland types according to Ramsar guideline	Features						Values				Remarks
				Origins (N, natural; A, artificial)	Water quality *1	Permanence of water *2	Seasonal water level fluctuation	Tidal influence	Catchment area *3	Ground water recharge	Flood control	Sediment trapping	Shoreline stabilization *4	
29	L40-1	Del Rei wetland system	Ts, O, 3, 4	N			○		S*4		○			
30	L40-1	Banhado dos Afogados	Ts, 3, 4	N			○		S					
31	L40-1	Rice paddy I near BR-471	3, 4	A		○			S					
32	L40-1	Banahdo de São Miguel	M, Ts, 4	N			○		L*3					
33	L40-1,2	Barra Falsa wetland system	Ts, 4	N			○		S					
34	L40-3	Lagoa Mangueira	O	N		○	○		S					
35	L40-2,3	Banhados between Taim and Quinta	Ts, O, 4	N			○		S					
36	L40-3	Estação Ecológica do Taim	E	A		○	○		S					
37	L40-3	Arroio Pastoreio	Tp	N					S				○	
38	L40-3	Coast between Rio Grande and Chuí	M, Ts	N				○						
39	L40-5	Arroio Juncal	L, Xf	N		○								
40	L40-4	Rio Jaguarao	L, Xf	N			○		L				○	
41	L40-5	Banhado Mundo Novo	Ts, 4	N			○							Tidal influence artificially prevented
42	L40-5	Banhado Mato Grande	Ts, 4	N			○							Tidal influence artificially prevented
43	L40-1,5,6,7	Canal de São Gonçalo and Lagoa Formosa	M, O, 4, 9	N			○	○	L				○	Tidal influence artificially prevented
44	L40-6	Rio Piratini	M, Xf	N			○		L				○	
45	L40-7	Arroio Pelotas	M	N										Tidal influence artificially prevented
46	L40-5	Lagoa Mirim western (L40-5) side	O, Ts, 4	N			○		L		○	○		Tidal influence artificially prevented
47	L40-1	Lagoa Mirim north-eastern (L40-1) side	O, Ts, 4	N			○		L		○	○		Tidal influence artificially prevented
48	L40-1	Lagoa Mirim south-eastern (L40-1) side	O, Tp, 4	N		○	○		L		○	○		

Note: *1; Apparently polluted; *2, Without outlets except for artificial ones; *3, larger than approximately 1,000km^2; *4, Limited to adjacent areas of the wetland; *5, River shore included.
Coastal wetlands: E (sand shores, dune systems), H (brackish and freshwater marshes) and J (brackish to saline lagoons with at least one relatively narrow connection to the sea).
Inland wetlands: L (permanent inland deltas), M (permanent rivers/streams in many places), O (permanent freshwater lakes in many places), Ts (Seasonal freshwater marshes, seasonally flooded meadows in many places) and Xf (Seasonally flooded forests).
Human-made wetlands: 3 (Irrigated rice fields), 4 (Seasonally flooded wet meadow or pasture), 6 (Water storage areas) and 9 (Canal).

Table 5.2-4 Water-related status of selected wetlands at Patos Lake Basin

No.	Wetland Areas	Factors Affecting Wetland Water Level and/or Salinity	Potential Threats on Water Balance and Quality
1	Rio Camaquã riverside	Precipitation in P1, P2 and P3	Upland erosion
2	Parque Estadual do Camaquã	Precipitation in broad catchment area of Camaquã River	Upland erosion; Sedimentation at river mouth
3	Agricultural reservoirs near Arambaré	-	-
4	Wetland system near Lagoa do Cerro	-	-
5	Lagoa Formosa (near Tapes)	-	-
6	Arroio Velhaco	Local precipitation	-
7	Banhado do Caipira	Local precipitation; water level of Patos lake	-
8	Arroio Grande in L30-6	Local precipitation	-
9	Lagoa Pequena	Water level of Patos lake; consequent salinity change; drainage	Dry-up of marshes by illegal drainage channel construction
10	Parque Estadual de Itapuã	Acid lake in the area	-
11	Lagoa dos Barros	-	-
12	Lagoa Capivary	Local precipitation; water level of Patos lake	-
13	Lagoa dos Gateados	Local precipitation; water level of Patos lake	-
14	Banhado Grande in L20	-	-
15	Banhado das Casimbas	-	-
16	Lagoa da Reserva	Intake of irregation water	Influence of inappropriate irrigation use on water level
17	Lagoa do Rincão	Intake of irrigation water	Influence of inappropriate irrigation use on water level
18	Lagoa do Sumidouro	Intake of irrigation water	Influence of inappropriate irrigation use on water level
19	Banhado Claudinho	-	-
20	Coastal lakes north of Peixe National Park	Salinity differs by lakes according to connection status to the sea	Local precipitation, contraction of connection to the sea
21	Lagoa do Peixe National Park	Local precipitation; contraction of connection to the sea that maintains salinity of the lake	Illegal cut out of sea-lake connection by local people for innundation control may largely influence to both salinity and
22	Coast between Peixe N.P. and Rio Grande	-	-
23	Lagoa da Turnera	-	-
24	Lagoa dos Patos eastern (L20) side	Inflow from Rio Guaiva	Water quality deterioration by urban/industrial discharge from Rio Guaiva
25	Lagoa dos Patos western (L30-5,L30-6) side	Inflow from Rio Guaiva	Water quality deterioration by urban/industrial discharge from Rio Guaiva
26	Lagoa dos Patos estuarine (L40-2) part	Tidal influence	Water quality deterioration by urban/industrial discharge from Pelotas and Rio Grande
27	Ilha da Torotama	-	-
28	Saco do Mangueira	Tidal influence	Water quality deterioration by urban/industrial discharge from Pelotas and Rio Grande

-': no information

Table 5.2-5 Water-related status of selected wetlands at Mirim Lake Basin

No.	Wetland Areas	Factors Affecting Wetland Water Level and/or Salinity	Potential Threats on Water Balance and Quality
29	Del Rei wetland system	Local precipitation; irrigation use	Inappropriate irrigation use and encroachment of rice field
30	Banhado dos Afogados	Local precipitation; irrigation use	-
31	Rice paddy I near BR-471	Agricultural control	-
32	Banahdo de São Miguel	Precipitation and water use in Uruguay	-
33	Barra Falsa wetland system	-	-
34	Lagoa Mangueira	Local precipitation; irrigation use	Inappropriate irrigation use
35	Banhados between Taim and Quinta	-	-
36	Estação Ecológica do Taim	Local precipitation and irrigation use of Lagoa Mangueira	Inappropriate irrigation use of Lagoa Mangueira water
37	Arroio Pastoreio	-	-
38	Coast between Rio Grande and Chuí	Local precipitation; water level of Patos Lake	No impending threats
39	Arroio Juncal	-	-
40	Rio Jaguarao	-	-
41	Banhado Mundo Novo	Water level of Mirim Lake	-
42	Banhado Mato Grande	Water level of Mirim Lake	-
43	Canal de São Gonçalo and Lagoa Formosa	Water level of Mirim Lake; tidal influence	-
44	Rio Piratini	Precipitation of M6 sub-basin	-
45	Arroio Pelotas	Precipitation of small M8 sub-basin	-
46	Lagoa Mirim western (L40-5) side	Water level of Mirim Lake	-
47	Lagoa Mirim north-eastern (L40-1) side	Water level of Mirim Lake	-
48	Lagoa Mirim south-eastern (L40-1) side	Water level of Mirim Lake; wind on the lake	-

-: no information

Table 5.2-6 Ecological status of selected wetlands in Patos Lake Basin

No.	Wetland Areas	Ecological Characteristics of the Site	Potential Threats Affecting Ecosystems
1	Rio Camaquã riverside	-	Vegetational change by cattle invasion
2	Parque Estadual do Camaquã	Largest riverine forest in this region (though forest downstream of Pacheca is becoming patchy); Very rich in forest/shrub birds (including endangered species e.g. *Trogon surucura*); Tributaries at river mouth delta seems important for fish spawning.	Vegetational change by cattle invasion; Illegal settlement at the mouth
3	Agricultural reservoirs near Arambaré	-	-
4	Wetland system near Lagoa do Cerro	Palms and tracts of forest; Occurrence of rare Butia capitata	Vegetational change by cattle invasion
5	Lagoa Formosa (near Tapes)	Concentration of Anatidae during the winter.	Vegetational change by cattle invasion
6	Arroio Velhaco	-	-
7	Banhado do Caipira	Extensive wetland with forests, reedbeds, sedges and low grass open marshes	Vegetational change by cattle invasion
8	Arroio Grande in L30-6	-	-
9	Lagoa Pequena	Large wetland with varied ecosystems; Rich in waterfowl; Endangered plants and birds (e.g. *Carpornis cucullatus*) occur in	Highly impacted by overgrazing and drainage activities
10	Parque Estadual de Itapuã	-	Vegetational change by cattle invasion
11	Lagoa dos Barros	-	-
12	Lagoa Capivary	More than 5,000 concentrations of Anatidae in winter	Vegetational change by cattle invasion
13	Lagoa dos Gateados	More than 5,000 concentrations of Anatidae and Rallidae	Vegetational change by cattle invasion
14	Banhado Grande in L20	-	Vegetational change by cattle invasion
15	Banhado das Casimbas	-	Vegetational change by cattle invasion
16	Lagoa da Reserva	More than 5,000 concentrations of Anatidae in winter	Vegetational change by cattle invasion
17	Lagoa do Rincão	-	Vegetational change by cattle invasion
18	Lagoa do Sumidouro	-	Vegetational change by cattle invasion
19	Banhado Claudinho	-	Vegetational change by cattle invasion
20	Coastal lakes north of Peixe National Park	-	Vegetational change by cattle invasion
21	Lagoa do Peixe National Park	Famous for visit of many migratory waterbirds; last area in the state that predominates littoral "restiga" vegetation. (refer to Ecosystem	Vegetational change by cattle invasion; Salinity and water level change
22	Coast between Peixe N.P. and Rio Grande	Visited by many migratory waterbirds	Vegetational change by cattle invasion
23	Lagoa da Turnera	-	-
24	Lagoa dos Patos eastern (L20) side	-	Vegetational change by cattle invasion
25	Lagoa dos Patos western (L30-5,L30-6) side	-	Vegetational change by cattle invasion
26	Lagoa dos Patos estuarine (L40-2) part	Rich in aquatic biodiversity; Otariidae and Delphinidae (including *Pontoporia*) are among regular members	Vegetational change by cattle invasion; Urban encroachment
27	Ilha da Torotama	Salt and freshwater marshes mata-da-restinga with patches of forest and fixed dunes	-
28	Saco do Mangueira	-	Water quality deterioration

-: no information

Table 5.2-7 Ecological status of selected wetlands in Mirim Lake Basin

No.	Wetland Areas	Ecological Characteristics of the Site	Potential Threats Affecting Ecosystems
29	Del Rei wetland system	Very rich avi-fauna	Shrinking of wetland area by rice field encroachment; Cattle invasion; Influence of water level on vegetation
30	Banhado dos Afogados		Vegetational change by cattle invasion
31	Rice paddy I near BR-471	About 1,000 native emu counted by IBAMA	Road kill
32	Banahdo de São Miguel	-	Vegetational change by cattle invasion
33	Barra Falsa wetland system	Concentrations of Anatidae and Rallidae in winter	Vegetational change by cattle invasion
34	Lagoa Mangueira	Rich in waterfowl as well as passerine birds in the forest	Water level change for irrigation
35	Banhados between Taim and Quinta	Comprised of sedges and reedbeds mingled with sandy fields; Peat marshes dominated by Cyperaceae	Vegetational change by cattle invasion
36	Estação Ecológica do Taim	About 236 birds, 150 aquatic plants were catalogued; Aquatic mammals Capivara and is common	Vegetational change influenced by water level of Mangueira Lake; Road kill
37	Arroio Pastoreio	-	Decline of Palm trees
38	Coast between Rio Grande and Chuí	Visited by many migratory waterbirds	Threats not impending
39	Arroio Juncal	Small size and poor overall condition surrounded by rice field; Concentration of migratory birds in winter	Vegetational change by cattle invasion
40	Rio Jaguarao	-	-
41	Banhado Mundo Novo	Concentrations of Anatidae and Rallidae in winter.	Vegetational change by cattle invasion; Agricultural land encroachment
42	Banhado Mato Grande	-	Vegetational change by cattle invasion; Agricultural land encroachment
43	Canal de São Gonçalo and Lagoa Formosa	Combined with neighboring wetlands it is among largest wetlands; Complexity in habitat types including forests, "sarandi" bushes, reedbeds, sedges, low grass open marshes	Vegetational change by cattle invasion; Various human activities due to proximity to highly populated area
44	Rio Piratini	-	-
45	Arroio Pelotas	Famous for visit of many migratory waterbirds;	-
46	Lagoa Mirim western (L40-5) side	Visited by many waterbirds	Vegetational change by cattle invasion; Agricultural land encroachment
47	Lagoa Mirim north-eastern (L40-1) side	Fluctuating vegetation of juncus, corticeira and sarandis in the northern marshes	Vegetational change by cattle invasion
48	Lagoa Mirim south-eastern (L40-1) side	-	Ecology of flat shore is susceptible to Mirim Lake water level; Vegetational change by cattle invasion; Encroachment of rice field

-: not yet investigated

Table 5.2-8 Land use at selected wetlands and adjoining areas

Patos Lake Basin

No.	Wetland Areas	Land Use							
		Urban area	Rice paddy	Pasture	Natural forest	Artificial forest	Marsh	Dune	Open water
1	Rio Camaquã riverside			○			○		○
2	Parque Estadual do Camaquã			○	○				○
3	Agricultural reservoirs near Arambaré		○	○		○			○
4	Wetland system near Lagoa do Cerro		○	○		○			○
5	Lagoa Formosa (near Tapes)		○	○		○			○
6	Arroio Velhaco		○	○	○				○
7	Banhado do Caipira			○			○		○
8	Arroio Grande in L30-6		○	○	○				○
9	Lagoa Pequena		○	○	○		○		○
10	Parque Estadual de Itapuã			○	○			○	○
11	Lagoa dos Barros		○	○	○				○
12	Lagoa Capivary		○	○		○	○		○
13	Lagoa dos Gateados		○	○			○		○
14	Banhado Grande in L20		○	○					○
15	Banhado das Casimbas		○	○					○
16	Lagoa da Reserva		○	○			○		○
17	Lagoa do Rincão		○	○			○		○
18	Lagoa do Sumidouro		○	○		○			○
19	Banhado Claudinho		○	○					○
20	Coastal lakes north of Peixe National Park		○	○		○		○	○
21	Lagoa do Peixe National Park		○	○	○	○	○	○	○
22	Coast between Peixe N.P. and Rio Grande					○		○	○
23	Lagoa da Turnera		○	○		○		○	○
24	Lagoa dos Patos eastern (L20) side		○	○		○	○	○	○
25	Lagoa dos Patos western (L30-5,L30-6) side	○	○	○	○	○	○		○
26	Lagoa dos Patos estuarine (L40-2) part	○		○			○	○	○
27	Ilha da Torotama			○			○		○
28	Saco do Mangueira	○		○			○		○

Mirim Lake Basin

No.	Wetland Areas	Land Use							
		Urban area	Rice paddy	Pasture	Natural forest	Artificial forest	Marsh	Dune	Open water
29	Del Rei wetland system		○	○			○		○
30	Banhado dos Afogados		○	○			○		○
31	Rice paddy I near BR-471		○	○		○			
32	Banahdo de São Miguel			○			○		○
33	Barra Falsa wetland system			○			○		
34	Lagoa Mangueira		○	○			○	○	○
35	Banhados between Taim and Quinta		○	○			○		○
36	Estação Ecológica do Taim		○	○		○	○	○	○
37	Arroio Pastoreio								
38	Coast between Rio Grande and Chuí			○				○	○
39	Arroio Juncal		○	○			○		○
40	Rio Jaguarao		○	○	○		○		○
41	Banhado Mundo Novo		○	○			○		○
42	Banhado Mato Grande		○	○			○		○
43	Canal de São Gonçalo and Lagoa Formosa	○	○	○	○	○	○		○
44	Rio Piratini		○	○	○		○		○
45	Arroio Pelotas	○		○					○
46	Lagoa Mirim western (L40-5) side		○	○			○		○
47	Lagoa Mirim north-eastern (L40-1) side			○			○		○
48	Lagoa Mirim south-eastern (L40-1) side		○	○		○	○		○

Table 5.2-9 Threats to selected wetlands at Patos Lake Basin

	Sub-basin	Wetland Areas	Deterioration factors												Remarks
			Human population density in the area	Illegal human settlement, urbanization	Development projects (incl. those in planning)	Diversion of water supplies	Siltation,	Drainage	Reclamation, (incl. waste dumping)	Pollution (urban, industrial and agricultural)	Over-grazing,	Excessive human disturbance,	Excessive hunting and fishing.	Natural succession of vegetation	Invasion of exotic species	
1	L30-3	Rio Camaquã riverside									○					
2	L30-4	Parque Estadual do Camaquã		○			○									Holiday cottage increase. Siltation at river mouth.
3	L30-5	Agricultural reservoirs near Arambaré														
4	L30-5	Wetland system near Lagoa do Cerro														
5	L30-5	Lagoa Formosa (near Tapes)														
6	L30-5	Arroio Velhaco														
7	L30-6	Banhado do Caipira														
8	L30-6	Arroio Grande in L30-6														
9	L40-8	Lagoa Pequena					○	○			○		○	○		Siltation at lake mouth.
10	L20	Parque Estadual de Itapuã			○											Squatters already moved out. Tourism as park management.
11	L20	Lagoa dos Barros														
12	L20	Lagoa Capivary			○		○									Tourism in small scale
13	L20	Lagoa dos Gateados														
14	L20	Banhado Grande in L20														
15	L20	Banhado das Casimbas														
16	L20	Lagoa da Reserva														
17	L20	Lagoa do Rincão														
18	L20	Lagoa do Sumidouro														
19	L20	Banhado Claudinho														
20	L20	Coastal lakes north of Peixe National Park												○		
21	L20	Lagoa do Peixe National Park	○		○			○			○			○		Touristic development
22	L20	Coast between Peixe N.P. and Rio Grande	○	○	○									○		Holiday cottages at Mostardas coast
23	L40-2	Lagoa da Turnera														
24	L20	Lagoa dos Patos eastern (L20) side									○					
25	L30-5,6	Lagoa dos Patos western (L30-5,L30-6) side	○		○					○	○					
26	L40-2	Lagoa dos Patos estuarine (L40-2) part	○		○		○	○		○	○	○	○			Siltation at Barra do Rio Grande
27	L40-2	Ilha da Torotama								○	○	○				
28	L40-2	Saco do Mangueira	○							○		○				

Table 5.2-10 Threats to selected wetlands at Mirim Lake Basin

No.	Sub-basin	Wetland Areas	Deterioration factors													Remarks
			Human population in the area	Illegal human settlement, urbanization	Development projects (incl. those in planning)	Diversion of water supplies	Siltation,	Drainage	Reclamation, (incl. waste dumping)	Pollution (urban, industrial and agricultural)	Over-grazing,	Excessive human disturbance,	Excessive hunting and fishing.	Natural succession of vegetation	Invasion of exotic species	
29	L40-1	Del Rei wetland system						○			○					
30	L40-1	Banhado dos Afogados						○			○					
31	L40-1	Rice paddy I near BR-471														
32	L40-1	Banahdo de São Miguel									○					
33	L40-1,2	Barra Falsa wetland system									○					
34	L40-3	Lagoa Mangueira														
35	L40-2,3	Banhados between Taim and Quinta			○											
36	L40-3	Estação Ecológica do Taim														
37	L40-3	Arroio Pastoreio														
38	L40-3	Coast between Rio Grande and Chuí														
39	L40-5	Arroio Juncal						○								
40	L40-4	Rio Jaguarao														
41	L40-5	Banhado Mundo Novo									○					
42	L40-5	Banhado Mato Grande									○					
43	L40-1,5,6,7	Canal de São Gonçalo and Lagoa Formosa	○	○							○				○	
44	L40-6	Rio Piratini									○					
45	L40-7	Arroio Pelotas									○					
46	L40-5	Lagoa Mirim western (L40-5) side					○				○					
47	L40-1	Lagoa Mirim north-eastern (L40-1) side					○				○					
48	L40-1	Lagoa Mirim south-eastern (L40-1) side					○				○					

Table 5.2-11 Affiliation between people and wetlands at Patos Lake Basin

No.	Wetland Areas	Accessibility for the public	Association facilities for the public*[1]
1	Rio Camaquã riverside	No road	none
2	Parque Estadual do Camaquã	Only two access points by road; by boat*[2]	none
3	Agricultural reservoirs near Arambaré	In private farmlands	none
4	Wetland system near Lagoa do Cerro	In private farmlands	none
5	Lagoa Formosa (near Tapes)	In private farmlands	none
6	Arroio Velhaco	Downstream of BR116 crossed by only one road	none
7	Banhado do Caipira	In private farmlands	none
8	Arroio Grande in L30-6	Access point limited only to BR116 bridge	none
9	Lagoa Pequena	Surrounded by private farmlands; By boat	none
10	Parque Estadual de Itapuã	Good road to the park	Camping, Resort and Museum facilities under construction
11	Lagoa dos Barros	Easily accessible from BR101	none
12	Lagoa Capivary	In private farmlands	none
13	Lagoa dos Gateados	In private farmlands	none
14	Banhado Grande in L20	In private farmlands	none
15	Banhado das Casimbas	In private farmlands	none
16	Lagoa da Reserva	In private farmlands	none
17	Lagoa do Rincão	In private farmlands	none
18	Lagoa do Sumidouro	In private farmlands	none
19	Banhado Claudinho	In private farmlands	none
20	Coastal lakes north of Peixe National Park	Coastal road exists; A lake adjoining to Tramandai	Fishing and marine sport facilities at Tramandai
21	Lagoa do Peixe National Park	Accessible by car at a few points	none
22	Coast between Peixe N.P. and Rio Grande	Partly accessible by driving a car along the beach	none
23	Lagoa da Turnera	In private farmlands	none
24	Lagoa dos Patos eastern (L20) side	In private farmlands; almost no accessible roads	none
25	Lagoa dos Patos western (L30-5,L30-6) side	Road accessibility limited to town areas	Water-sports facilities in major lakeside towns
26	Lagoa dos Patos estuarine (L40-2) part	Accessibility limited to urban area	Eco-Museum of FURG under construction at Ilha da Pólvara in Rio Grande; Carlos Ritter Natural Science Museum of UFPEL
27	Ilha da Torotama	Crossed by a local road; by boat	none
28	Saco do Mangueira	Western shore is urbanized; eastern shore is accessible at several points; local people enjoy leisure fishing.	none

*1,Zoological Park of Rio Grande do Sul at São Leopoldo displays mammals and birds including those already disappeared from the study area.

*2, 'By boat' indicates boat accessibility from Patos/Mirim Lakes.

Table 5.2-12 Affiliation between people and wetlands at Mirim Lake Basin

No.	Wetland Areas	Acceccibility for the public	Associastion facilities for the public
29	Del Rei wetland system	No traversing road; wetland edge accessible at a few points through private roads; by boat	none
30	Banhado dos Afogados	In private farmlands	none
31	Rice paddy I near BR-471	Seen from BR-471	none
32	Banahdo de São Miguel	Seen from a road on Brazil / Uruguay border	none
33	Barra Falsa wetland system	In private farmlands	none
34	Lagoa Mangueira	At several points of west shore by road; no access at east side	none
35	Banhados between Taim and Quinta	In private farmlands	none
36	Estação Ecológica do Taim	Closed to the public, but fauna and flora are easily seen from BR-471	Lecture room at IBAMA Taim office; Maintenance of displayed specimens not sufficient
37	Arroio Pastoreio	In private farmlands	none
38	Coast between Rio Grande and Chuí	Only at Cassino and other two points by road	none
39	Arroio Juncal	In private farmlands	none
40	Rio Jaguarao	In private farmlands	none
41	Banhado Mundo Novo	In private farmlands	none
42	Banhado Mato Grande	In private farmlands	none
43	Canal de São Gonçalo and Lagoa Formosa	Surrounded by private farmlands; crossed only by RS473; seen from BR392 and Embrapa; by boat	none
44	Rio Piratini	Crossed only by BR-116; by boat	none
45	Arroio Pelotas	In private farmlands; by boat	none
46	Lagoa Mirim western (L40-5) side	In private farmlands; by boat	none
47	Lagoa Mirim north-eastern (L40-1) side	In private farmlands; by boat	none
48	Lagoa Mirim south-eastern (L40-1) side	Road access only limited to old Santa Vitória do Palmar Port	none

By boat'; Accessible by boat from eoither Mirim or Patos Lake